Mesoscale Analysis and Forecasting

1d. Given appropriate data and handouts, encode a 24-hour terminal forecast IAW an evaluation checklist.

Symbolic Format

- CCCC TAF (AMD/COR/RTD) YYG1G1G2G2 ddd $f_m f_m$ G $f_m f_m$ KT VVVV $w^1 w^1$ NsNsNshshshsCC or VVhshshs or SKC WS$h_x h_x h_x$/dddffKT 6$I_c h_i h_i h_i t_L$ 5 $bh_B h_B h_B t_L$ QNH P2P2P2INS (Remarks) GGGGeGe or GGGG (Remarks) AMD/COR GGgg (Limited Forecasst Service Indicator) (FNXXT/QCYY)

Rules for encoding

- Forecast Area
  - Air Force - forecast for 5 statute-mile radius of runway complex
  - Navy and Marines - forecast issued for airfield control zone as per base operations manual/local forecasters handbook
    - Specification criteria is the time of occurrence, duration and intensity of expected weather conditions
    - Station Identifier - **CCCC** - by ICAO location, followed by the contraction **“TAF”**

Rules for encoding

- Valid time of forecast - **YYG1G1G2G2**
  - **YY -** current day
  - **G1G1** - beginning of forecast period and **G2G2** - ending of forecast period
  - Forecasts and corrected forecasts valid for 24-hrs (UTC)
    - » Navy and Marines - forecasts are issued at 03, 09, 15, and 21Z
    - » Air Force - forecasts are issued according to mission requirements
  - Encode “AMD”, “COR”, or “RTD” before the valid time to extend to the end of the original forecast

Rules for encoding

- Surface Winds, including gusts - **dddffG$f_m$$f_m$KT**
  - Direction **- ddd**
    - Forecast wind direction to the nearest 10˚
    - >60º variance, encode prevailing direction, append limits to remarks
    - “**VRB**” when prevailing direction can’t be forecast and speed <6 knots
    - "**VRB**" for **airmass** TS’s, put gust direction in remarks e.g. GUST DIRECTION 250

Rules for encoding

- Wind Speed - **ffG$f_m f_m$KT**
  - Forecast in whole knots (2 or 3 digits)
  - Encode gusts when ≥ 5 KTS above a mean of ≥10 knots
  - **Navy**: encode gust when peak winds exceed the mean wind by 10 knots
  - Add "KT" after wind speed or gust

Rules for encoding

- Visibility - **VVVV**
  - Prevailing visibility in meters (reportable values Table 1.1 in AFMAN 15-124)
  - Include obstruction to vision whenever visibility is 9,000 meters
  - Include weather symbols when unrestricted (Including MIFG)

Rules for encoding

- Weather and Obstructions to vision - **w'w'**
  - Construct weather groups in sequence, using Table 1.2 in AFMAN 15-124
  - Normally one weather group used
    - Order of entry
    - Encode **“+”** for well developed tornadoes/waterspouts and heavy precipitation
    - If thunderstorms are occurring with heavy precipitation, “+” precedes TS
    - “+” does not indicate **severe intensity**

Rules for encoding

- Undecided, select the most significant to aircraft operations
- Fog
- Encode shallow fog “**MIFG**”
- Use “**BR**” when visibility 1,000 meters
- Use “**FG**” when visibility <1,000 meters

– No significant weather - "**NSW**"

Rules for encoding

- Cloud Layer Group - **$N_sN_sN_sh_sh_sh_sCC$**
  - Report **all** cloud layers
  - Encode "**SKC**" to forecast clear skies
  - Cloud layer - **$N_sN_sN_s$**
    - Encode FEW, SCT, BKN, and OVC followed by cloud base AGL
    - Summation principle applies
    - Total obscuration, encode **VV** followed by vertical visibility

Rules for encoding

- Partial Obscuration
- Encode as FEW000, SCT000, or BKN000
- Include in summation computation

– Append CB at end of group

Rules for encoding

- WSh$_x$h$_x$h$_x$/dddffKT
  - Low-level windshear is a potentially hazardous problem for aircraft.
  - LLWS should be included whenever any of the following occur or forecasted to occur
    - Shear within 2,000 feet of the surface in the vicinity of the TAF airport
    - An indicated air loss of 20 knots or more are received from a PIREP

Rules for encoding

- When 10 knots or more per 100 feet in a layer more than 200 feet thick are expected or reliably reported within 2,000 feet of the surface at or near the TAF airport

Rules for encoding

- $WSh_xh_xh_x$/dddffKT, where
  - WS= an indicator meaning wind shear
  - hxhxhx= height at which the wind shear threshold is reached
  - ddd= direction, degrees true, of the forecast wind above the indicated height
  - ff= speed, in knots, of the forecast wind above the indicated heights; and
  - KT = a unit indicator, meaning knots
- The VAD wind profiles should be helpful in forecasting LLWS in the short term

Rules for encoding

- Icing - **$6I_ch_ih_ih_it_L$** **Not** associated with TSTM's
  - Icing indicator - **6**
  - Icing type (Table 1.4 in AFMAN 15-124)
  - Height of layers base (AGL) - see (Table 1.3 in AFMAN 15-124)
  - Thickness of layer - see (Table 1.5 in AFMAN 15-124)

Rules for encoding

- Turbulence - **5B$h_B h_B h_B t_L$** **Not** associated with TSTM's
  - Turbulence indicator - **5**
  - Turbulence type - see (Table 1.6 in AFMAN 15-124)
  - Height of layers base (AGL) - see (Table 1.3 in AFMAN 15-124)
  - Thickness of layer - see (Table 1.5 in AFMAN 15-124)

Rules for encoding

- Altimeter - $QNHP_2P_2P_2P_2INS$
  - Altimeter setting indicator - **QNH**
  - Lowest forecast altimeter setting - **$P_2P_2P_2P_2$**
  - **INS** follows altimeter setting
  - Initial forecast, BECMG and FM (**DO NOT USE IN TEMPO)**

Rules for encoding

- REMARKS
  - Do **not** use “OCNL” or “CB” in remarks
  - Do **not** substitute for a BECMG or TEMPO group
  - Limited Duty Stations-Less than 24 hour on site forecast support
  - Do **not** use CIG remarks
  - Abbreviations in Table 1-5; use FAA contractions

Rules for encoding

- "**VC**" (vicinity) >5, but <10nms
- Note to Air Force students- you can not carry VCTS in the remarks section
- Start-end times for conditions, avoid numerical confusion
- Desire order of entry
  - Low-level wind shear
  - Partial obscuration
  - Other remarks

Rules for encoding

- Change groups - TTTTT GGG_eG_e (or GGGG)
  - Type of change - **TTTTT**
  - Valid time - **GGG_eG_e (or GGGG)**
  - BECMG - gradual predominant change
    - Never exceeds 2 hours
    - Include all elements
    - Navy times will never exceed 4 hours and only include the changes that differ from the previous forecast period

Rules for encoding

- FM - rapid predominant change
  - Condition change <30 minutes
  - Include all elements
  - Forecast to nearest minute using 4 digits

Rules for encoding

- TEMPO - frequent brief change
  - Conditions on station (+ 15 min. for TS)
  - Aggregate time

- Note: Start a new line of text for each change group.

- APPLICATION: Students will practice encoding of TAF’s with practice data sets in class/homework.
- EVALUATION: A progress check at the end of the unit.